The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD DEVOTED EXCLUSIVELY TO CITRUS FRUITS

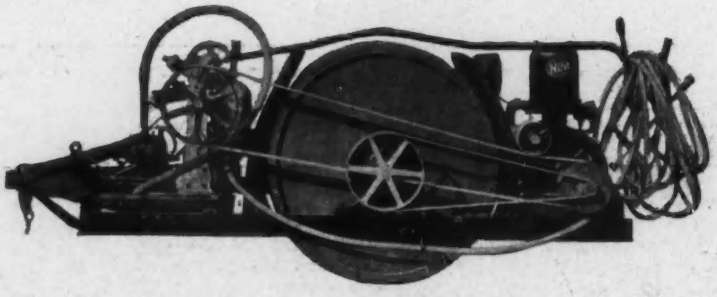
Issued Monthly

Representative of every interest—
Representing no special interest.

Vol. I | JUNE, 1920 | No. 6

Common Sense Applied to Spraying Outfits

Anybody knows that a wide-tired wagon will carry its load with less draft than one with narrow tires. The bearing surface of the VAN FLEET ROLLER SPRAYER is twice as great as that of any wheel-mounted sprayer of same capacity, while the diameter of its tank is at least one-third greater. A small wheel drops into inequalities and has to be dragged out, while a large one bridges them and rolls over easily.



LEFT HAND SIDE, SHOWING BELT TRANSMISSION, AGITATOR, ETC.

Our new Mechanical Agitator insures most perfect mixture, while tank is standing still as well as when in motion. Its many users in Florida are all boosters for it. They agree that after using it they would not go back to the old type of wheel-mounted sprayers under any condition.

IT PROVIDES:

Simplicity	Light Draft
Proper Suspension	Short Turning Radius
Perfect Balance	Accessibility of Parts
Maximum Power for Spraying	Ease of Operation
Small Expense of Upkeep	Absence of Excessive
Economy in Time and Money	Vibration

Would-be imitators try to avoid liability for infringement on our patent by adding a wheel or wheels, thereby destroying the advantage of the TRUE ROLLER SPRAYER over the WHEEL MOUNTED TYPE, and yet claim the advantages of the ROLLER type, which they thus admit they would like to get the benefit of.

Don't accept an imitation or substitute. THE VAN FLEET ROLLER SPRAYER HAS BEEN PROVED A SUCCESS IN ACTUAL OPERATION. Our new 1920 model is a great improvement over previous models. Send for illustrated circular, with prices.

The VAN FLEET COMPANY,

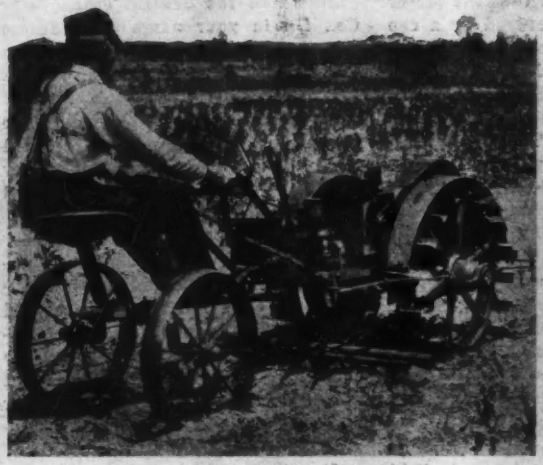
R. A. ELLIS, Manager,

Florence Villa, Florida.

The Oldsmar Garden Tractor

This small, light, easily handled tractor is especially designed and adapted for grove work. It will plow, harrow, work in fertilizer around the trees, work up close to the trees and eliminate a lot of hand work. And when the fruit is picked, a trailer can be attached and the Oldsmar will haul it out of the field. This tractor is built low and will not knock the fruit from the trees, neither will it nibble the branches.

It is in the citrus groves of South Florida and California that the Oldsmar finds its greatest popularity, and the management of the company states that the demand from grove owners alone is swamping the big plant at Oldsmar.



PRACTICAL DEMONSTRATION OF OLDSMAR TRACTORS
In Use On Florida Groves and Farms

Below are given some of the salient points in the construction of the Oldsmar:

The crankcase of the engine and the main frame are cast integral. The engine crankshaft runs on plain bearings. At its left end is a pulley. This pulley is belted to a large fly-wheel pulley running on a shaft back of the axle. The shaft is supported in the housing casting of the engine and at the other on the frame unit. On the left end of this shaft is the small spur pinion which drives a large bull gear on the live axle. A heavy-duty fabric belt is used to transmit the power from the pulley on the end of the engine crank-shaft to the pulley on the drive-pinion shaft to the rear.

Above the fabric drive belt is an idler pulley. This is supported by an arm attached to the cylinder block of the engine. The arm is under spring tension, being connected through a coil spring and a rod to a lever on the handle of the tractor at the rear. This lever is pivoted on a cross bar extending between the two handles and having a similar lever at its other end to permit control of the idler pulley from either side. This is for belt tension regulation.

The engine of the small tractor is a single-cylinder air-cooled type, with a bore of 5 inches and a stroke of 5½. The cylinder sets horizontal and at 580 r.p.m. The belt horsepower developed, according to the new formula of the E. A. E., is 3.27. The cylinder is air-cooled, a fan being placed at the right side toward the rear, and driven by a belt from the fly-wheel on the right end of the engine crankshaft. There is a shroud around the fan to protect it from weeds, etc. Lubrication of the engine is through the splash system, gravity carrying the splash oil to the more remote bearing surfaces.

The carburetor is a 1¼-inch Ideal and a dry type air cleaner is used to purify the intake air before it enters the carburetor. This air cleaner is at the top of an air intake tube extending upward from the carburetor. The exhaust pipe goes back from the cylinder head and terminates in a muffler.

There is a positive, toother clutch for each wheel. A cast collar fits over the live axle on each end and its inner face is notched. These notches mesh with similar notches on the outer face of the wheel hub. When the wheels are being driven the collar is held in mesh with the wheel. The wheel is mounted freely on the live axle, but the collar is keyed to the axle and always revolves with it.

A long lever extends from the back part of the tractor to the front end of the frame, where it is attached by a pin. By riveting a short section to this lever where it passes over the collar on the axle, it completely encircles the collar. There is an annular groove in this collar into which two short pins extend, one from above and one from below. This lever, with its connection to the collar through the pins, is the control medium for the clutch mechanism. Pulling it out at the rear slides the collar out on the axle and disengages the wheel, which is then free on the axle.

This same arrangement is used on both wheels. In this way steering is assisted in turning either way.

In the center of the rear of the frame is a quadrant set vertical with notches along its convex edge. A lever attached to the drawbar is pivoted at the center point of this quadrant and is held in any set position by a spring pin fitting into the notches. This is for adjusting the height of the drawbar. The drawbar proper is attached to the second front frame cross member. It is built up, and can be seen in the view of the tractor which accompanies this description.

REAL TEST OF A TRACTOR IS "HOW MANY ACRES PER DAY"

Any one considering the purchase of a tractor should satisfy himself positively as to the working power of the machine offered him.

Many manufacturers rate their product as a "three plow" or "four plow" machine, as the case may be. This does not give the buyer an idea as to the amount of work the tractor will do, say the makers of the Wallis.

The instances are numerous where a big, slow, heavy-weight tractor pulling 5 or 6 bottoms has done actually less in a day than the Wallis—the recognized standard, light-weight, fast machine.

It is true that much depends upon local conditions, but it has already been proven that all conditions being equal the Wallis will do more work per day than any other tractor of equal rated power.

Then, too, we must not forget that a large part of the value of a tractor is the quality of work done.

In demonstrations of various kinds the Wallis has always come forward with excellent work. A subsoiler can be used, with the Wallis, to break up the hard plow pan and thus improve soil conditions.

The Wallis is commonly called a "ten acre per day" tractor. Under average conditions of soil it will plow in combination with suitable implements an acre per hour. Where soil conditions are difficult it will pull fewer bottoms but will pull them fast, so that at the end of the day the same amount of work is done.

It is true that the farmer is familiar with machinery and also that he is a good mechanic, understanding and capable of handling an engine much better than the average man.

But for that very reason he knows that all things being equal, a simple, dependable machine requiring least repair and adjustment is the most economical and easiest to handle and that the upkeep expense is apt to be much lower than with the complicated and crude construction.

The Wallis designers were aware of this. They were perfectly familiar with farm problems and knew exactly the conditions which a tractor is required to meet.

Hence, the Wallis is a very simple piece of machinery. Any boy can understand its principles—can drive it and make all necessary minor adjustments.

The Wallis Tractor has set a standard which tractor manufacturers recognize today.

Because of its perfected unit power plant, enclosed gears, "U" frame, etc., it is out of the experimental stage. We do not ask that you take our word for this. Before you decide, see a Wallis Tractor on a dealer's sales floor or in the field, and then draw your own conclusions.

The scientific way all working parts are enclosed in the Wallis Tractor is realized by the man of experience as the ideal way of protecting those parts which are responsible for a tractor's efficiency.

The Wallis was the first to completely enclose gears and moving parts. The "U" frame construction provides a constant bath of oil. Perfect fitting, oil-tight joints and covers prevent dust from getting into crank case or transmission housing.

You will find even that the motor head is effectively covered by a cap to prevent dust from entering through the valves into the cylinders.

You will find no unnecessary weight in the Wallis, America's Foremost Tractor. This is well illustrated in the patented "U" frame construction. All I-beams, braces and bolts which so often cause troubles, damage and heavy repair bills are entirely eliminated. The "U" frame saves weight, makes the Wallis sturdier than the ordinary tractor, and serves a four-fold purpose. It is the base of the crank case, transmission case, acts as a frame, and oil reservoir. Made of 3-16 inch boiler plate steel, the strongest known to mechanics, it stands the hardest twists and strains of field service.

THE CASE TRACTOR A WINNER IN FLORIDA SOIL

If it were possible for you to consult a group of the foremost tractor engineers on the purchase of a tractor, if you were to seek their advice and accept their unbiased opinions, here are some of the things they would say to you:

Choose the tractor with a four-cylinder valve-in-head motor designed to stand the severe service a tractor motor is subjected to. It should burn kerosene economically—it should continuously develop its full rated horsepower on that fuel without overheating. Choose a tractor that can develop a liberal reserve in excess of its rated horsepower. Choose the tractor with all cut steel, spur gears, the simplest type of transmission and assurance for durability. Choose the tractor that has all vital working parts enclosed in dust proof, oil tight housings. Choose the tractor that provides accessibility. Choose the tractor that has a high grade, high tension, dust and water proof magneto, requiring no batteries. Choose the tractor that is handy for all drawbar and belt work. Choose the tractor built by a concern whose reputation you know to be excellent and with sufficient financial responsibility to make its guarantee worth something to you. Choose the tractor backed by a concern with active, up-to-date branch houses and dealers to give the right kind of service at the right time.

The "Case" tractor is designed to meet just these requirements. It is built for service. If you are interested in tractors, if you contemplate buying this fall or next spring, clip out the coupon in the "Case" advertisement of the Traffic Truck Sales Co., fill in your name and address and mail to the Traffic Truck Sales Co., 1609-1611 Franklin St., Tampa, Fla., and descriptive booklets and catalogues will be mailed you. The "Case" tractor can now be secured right "at home," and the sales agency will be pleased to give a practical demonstration of its workings.

The Case 10-18 is an ideal size for small or large farms. On many unusually large farms and ranches several of these small tractors are used which makes possible the performance of various tasks at one and the same time. Whether the 10-18 is best suited to your needs depends on your particular belt and drawbar requirements.

It pulls two 14-inch plows in hard and tough soil or three 12-inch bottoms under favorable conditions. Pulls a 7 or 8 foot tandem disc harrow, a 5 section spike tooth harrow, a 22-shoe grain drill, two 6-foot binders or the largest manure spreader. Being light in weight prevents soil packing and makes it well suited for seeding and discing. It is ideal for road work, pulling a Case No. 3 road grader or a pair of road drags. For general hauling it handles easily from 5 to 10 tons depending on road and grade conditions.

The Case 10-18 tractor has ample reserve power for temporary hard pulls. No tractor leaves the Case factory until rigid motor tests indicate a liberal reserve above the rated horse power. The 10-18 is compact and low down which makes it ideal for orchards.

Over ninety-nine per cent of all Case parts are built complete in the Case shops. Here they have every facility for accurate manufacturing under careful inspection and supervision.

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Our Transportation Problem

By P. L. Waycoup

The United States of America at the outbreak of the great war presented a spectacle of perhaps the most wonderful business fabric in history, built up very largely on the free and fast transportation of the productions of each of its various sections to each of the others.

We were accustomed to brag of our railroads, and compared with the relatively puny efforts at railroading on the part of other nations we had a right to be proud of our transportation achievements. The New England manufacturer was accustomed to obtain delivery of his products at points upon the Pacific slope with a degree of despatch and dependability which was unrivaled by the transportation systems of other nations where distances could not be compared. Apples from the Northwest were available to the inhabitants of the South Atlantic states in less time from their gathering than in European countries would be required for a distinguished passenger to make a trip of similar distance upon the schedules of the finest limited services. The citrus fruits from California and from Florida were in the hands of dwellers in the bleak north so quickly that none of their flavor or luciousness was lost in the short trip from trees to tables. Our people were accustomed to depend upon many products unseasonable in their own climates, but which quick and economical transportation made easy of procurement.

It was a natural result of this speedy and reasonable transportation of all the various things we produced that we became victims of the habit of sectional specialization. Who can think of Detroit without visualizing automobiles; of Kalamazoo without the thought of that succulent celery which has made this section of Michigan famous; of the Jersey shore without recurring thoughts of the cranberries that are the universal American accompaniment for the roast turkey of Thanksgiving and the holidays? Pittsburgh means steel for the nation. Stone Mountain, Georgia, a short way out of Atlanta, has meant granite curbing for most of the cities east of the Mississippi river, while we have all over the nation adopted the beautiful granite from the Vermont quarries to mark the resting places of our departed members. Rocky Ford doesn't mean a small town in Colorado to the American nation; it means cantaloupes.

A superb system of swift and speedy transport built up a nation the component parts of which had grown so accustomed to depending upon each other that no section thought of the desirability of being self-maintaining. On the other hand quantity production with corresponding decreased costs stood out as the great American idea.

Then came the war.

And with the war came a new system in business. Things must be done, and done in a hurry. The characteristic speed of the nation was not fast enough for the occasion. Everything must be speeded up to the utmost. Even in politics and the practice of economics came the urgency of speed and yet more speed; and with it came the new system of "passing the buck" as a method of settling affairs of great moment. Principles and time honored methods were cast aside for expediency—that's the thing. Don't let the wise ones tell you we are suffering from the high cost of this or that. What we really have been suffering from, and continue to suffer from, is the High Cost of Expediency. Expediency substituted for principle, deep thought and thorough consideration has brought us to our present predicament or series of predicaments. Confronted by very real and deeply serious problems it has become a habit to seek quickly the line of least resistance, to "pass the buck," instead of actually settling these problems.

When the railroad brotherhoods, taking the fullest and unfairest advantage of the proximity of our entrance into the great war, threatened the public with a nationwide strike and consequent complete tie-up of transportation, expediency came to the rescue. Congress and the administration panicky and anxious to conciliate gave the workers what they asked, and "passed the buck" to the public very shortly in the way of greatly increased freight charges and greatly reduced railroad service. The Adamson Law, however, was but the beginning of a series of performances in "passing the buck," which have made commercial history

during the last three years. Profiteering, indeed, is but the act of "passing the buck" to the next fellow, meanwhile charging for this service all that the traffic will bear.

It is but a natural, and wholly logical, result that from bad we have gone to worse. None of our basic problems of employment, of production or of transportation, have been settled for any time. Expediency substituted for fixed policy simply has served the purpose of the moment, and the reckoning postponed until the morrow. Tomorrow never comes, so they say; but we have got to admit the time is coming when all these things which have been kept juggled in mid-air must be handled skilfully and immediately, or the resulting crash will far exceed any commercial disaster in the history of the nation.

Prices continue to rise. Workers demand and obtain more wages to offset these prices, and as a consequence force prices still higher. Compared to the performances of the American public during the last twenty-four months the spectacle of a puppy chasing his tail in a whirling circle is one of staid soberness and earnest and logical occupation. We are tired of the self-created dilemas which one after another confront us; but seemingly we are nationally incapable of the sober sort of thought and consideration which is required of us. Expediency, having been the solution so often recently seems to have fixed itself upon us as a habit; and instead of seeking some satisfying solution of whatever arises we are inclined to continue the process of dodging the issue and "passing the buck."

One of the latest efforts in this direction is the formal request of the railroads for further and horizontal raises of freight rates on all products, which now threatens the citrus growers with approximately 24 per cent more freight on their products. Not much, you may say, but at that it is doubtful if the camel's owner ever knew just which straw brought on the historic catastrophe. The question of whether or not the citrus industry can survive these continued impositions upon it is one which only the experience of the future can demonstrate. However, there is sufficient ground to justify serious consideration of the plaint of those growers who allege the railroads are about to engage in the playful pastime of cutting open the golden goose, to see where the eggs come from.

One thing we do know: The growers of perishable products have nothing to do with fixing the market prices paid for them. Once a vegetable or fruit is clipped from its parent stem it becomes a distinct and pressing liability until its sale is speedily and definitely effected. Cold storage is available only for a small percentage of such products, while there are many of them which may not be handled successfully by cold storage even if facilities were to be had. Citrus fruits are not the most perishable of these products, but they are sufficiently perishable that their handling must be speedy and their sale quickly consummated or decay will soon reduce or extinguish any value in commerce.

Therefore citrus growers may not join the grand procession and continue the process of passing along increased costs. The markets in the last six months have adequately demonstrated this fact. Graphic charts of the values of various commodities definitely show that citrus fruits, along with many other perishable foodstuffs, more recently have been left far behind in the procession of high prices. Only the refusal of the trade to handle, and the public to consume these things at the highest price-levels is responsible for this. It is rather as if it had been said: "This much will we pay and no more." And the growers have had no choice but to abide by a decision in price fixing in which they have had no voice. Meantime their costs of production and of handling have continued onward and upward until there are serious complications ahead in the near future unless relief obtains.

It is true that the citrus growers, as well as the growers of other perishable foodstuffs, must have transportation for their products. As a rule these things are produced in areas particularly suited to their production, and which specialize in them to an extent which makes their consumption at home or close to home entirely out of question. The railroads claim that in consequence these growers are vitally interested in helping them to obtain the increased rates which will for the moment aid in solving their most pressing problems. As to the future, who cares?

However, from the standpoint of a grower, who is most surely "up a tree," the situation bears a remarkable reesmblance to some of the previous performances in "passing the buck" which are well remembered. The real question which inevitably comes up in the mind of any thinking man is whether or not this is just another case of substituting expediency for a sincere effort to solve our transportation problem.

As a matter of fact, are not the railroad managements simply drifting with the current of present day carelessness, content to pass along to the public the burdens of their business? Will any real solution of our transportation problem be reached until further continuation of this practice is made impossible? Congress has relieved them in large part of any responsibility. However flagrant their mismanagement of these great properties so vital to our national welfare, they need not worry. The public must meet the bills in the form of whatever increases are necessary to meet the guaranteed percentages upon the investments as shown by the corporate books. As an example in "buck passing," this one deserves to head the list.

Government operation of our railroads was a nightmare; but the situation created through the actual operation of the Cummings-Esch law puts us rather in the position of the man who screamed aloud in his sleep and thus awoke himself from a dream of drowning, only to find that his house was on fire. No thinking man who had any experience as a shipper wants to go back to government operation of the railroads; but no thinking man with shipping experience can feel the present situation is one long to be endured.

What is really needed right now is some two-fisted individual in public life to stand up before the nation and state aloud the facts of the situation in words which all may comprehend, and so forcefully that all must heed. Someone with the common sence of Abe Lincoln and the force of Roosevelt would just about meet the specifications. Such a man might well say:

"Mr. Railroad Manager, you are continuing to conduct your road upon the scandalous scale of extravagance which came into being during the war. You are making no proper effort to abate this. You are carrying upon your payrolls a great many more persons per mile of line operated than you did prior to the war; and you are rendering your shippers and your traveling public less service in return. You claim there is a shortage of cars and other equipment because these things were destroyed and no adequate provision made to replace them, yet you allow the handling of what you have in such slow and dilatory fashion that your equipment requires from two to five times as long to complete a round trip as formerly it did. You know full well

that had these been handled thus slowly before the war that this alone would have been sufficient to create a serious shortage. The business of the country has continued its natural growth, yet you are expecting to handle it with less service than formerly, while expecting it to pay you vastly increased sums therefor. Now, Mr. Railroad Manager, you stand indicted of these things, which are self-proven against you. Therefore, you are no longer performing an economic service which justifies paying you at the rate you formerly were paid; and unless there is some immediate change in your attitude, and some mending in your ways, your services must be dispensed with. This we will do through the medium of the federal courts and receiverships, and sell your properties for whatever they will bring to whoever will undertake to perform the service for which the public is expected to pay."

And to the railroad worker he might well address this warning, "You have in times past performed a valued service to the country. However, there has recently been noticed a failure upon your part to render wholehearted and efficient service, notwithstanding the fact you are asked to work less hours, and to do less actual work by reason of the work being divided among a greater number of workers, and notwithstanding you are being paid the highest wages in the history of the business in which you are engaged. Formerly the operation of trains upon scheduled time was a matter of personal pride with you. Now, however, if a train gets behind time, as most of them frequently do, we not only fail to hear of time being made up on any division of any road, but experience shows that trains become progressively late as their journeys continue. You are said to have replaced your former interest in over-performance by a present interest in over-time. You are progressively demanding more and more while in point of service you are progressively giving less and less. Formerly you worked solely for the railroad owners. Now, however, you have made it necessary for the public to become in part your employer by furnishing more or less directly payment for your services. Therefore, I am saying to you in behalf of the American public that your work will have to measure up more nearly to your wages, or it will be necessary to dispense with your services. If it becomes necessary we shall do this by giving you the much needed rest you seemingly crave, and putting in your place some earnest and less well paid school teacher or other person, who reasonably well may be expected to learn your duties within a very brief period of time, and to perform them satisfactorily. Be assured there shall be no attempt to take away from you or your fellows your right of collective bargaining. However, we, the public, will hold that, while you shall not be deprived of the right to strike, the laws of our country otherwise must be enforced. Our constitution recognizes and guarantees to every man and woman the right to work as he or she choses. Therefore any resort to violence or intimidation to prevent any man or woman from exercising this constitutional privilege will be dealt with immediately and fully to the extent of the law. We, also, shall hold any attempt to interfere by violence with commerce between the states to be treason, the penalty for which is death."

It sounds well doesn't it, whichever way you read it, forward or back? Wouldn't it create a hullabaloo if some real two-fisted man dared voice these things which so many are thinking? Unfortunately that man hasn't been put forward upon the democratic, republican or prohibition tickets, nor is it to be expected he will be found in the ranks of socialism. In the meantime, what is to be done? What is your congressman doing about it? What have your senators signified as their dignified intention in the premises? What are you, Mr. Citrus Grower, going to do about it? Do you think it will be possible for you to "pass the buck?"

Control of Red Spider Pest

One of the common pests of citrus groves, both in Florida and California, is the red spider, which in reality is not properly speaking a spider but a mite. Of these spider mites there are two species, but for the purpose of this article both the six-spotted mite and the purple mite are considered under one head.

These mites have caused Florida citrus growers an endless amount of worry and incalculable loss in fruit, while in California their ravages have probably been even greater. Every section of the citrus belt in the latter state has been forced to contend with this pest, but its activities have been unusually pronounced in the Chula Vista section, where climatic conditions appear to make for its almost continuous infestation of groves.

At the present time extensive investigations are being carried on at that point by state and federal agents to determine the best means of combatting the pest.

In Florida a deep study of the character and habits of the spider mite, and the best methods of combatting its ravages, has been made by J. R. Watson of the state agricultural experiment station at Gainesville, who has prepared and issued a bulletin dealing with this annoying and destroying pest, which is perhaps one of the most comprehensive treatise on the subject which has been issued.

Both the six-spotted mite and the purple mite are sucking pests. The mouth formation is such that this minute insect cannot chew, but is so modified that it is able to pierce the plant and suck out nourishment. It feeds upon the epidermal tissues of the leaves and fruit. Like the rust mite, the spide mites are most troublesome in dry weather.

There are many natural enemies of the spider mites which prey upon them and tend to reduce their number and check their ravages. Both the larvae and the adults of ladybeetles and the larvae of lace-winged flies feed upon them, as also do the aleurodothrips.

Six-Spotted Mites

The six-spotted mites attack the under sides of the leaves where they spin thin, tent-like webs under which they stay. As their sucking of nourishment proceeds, the leaves turn yellow in spots under the web. These spots increase in size as more sap is withdrawn until finally the entire leaf becomes yellow, curls up and falls. In cases where many of the leaves are lost, the fruit also falls from the devitalized trees and the financial loss thus occasioned is direct and severe. The young show few or none of the spots which are characteristic of this species of the spider mite.

Purple Mites

The purple mite is much less destructive than the six-spotted mite, and is found on both sides of the leaves and also on the fruit. The

(Continued on Page 10)

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CITRUS BY-PRODUCTS

THERE are wonderful possibilities in citrus by-products —even greater possibilities than the average citrus grower, buyer or shipper realizes.

Last month The Citrus Industry published a paper read by Mr. J. W. Sample at the meeting of the State Horticultural Society at Ocala, in which the importance of this industry was stressed. Mr. Sample is one of the men who recognize the importance to citrus growers of the development of the by-products industry, and he is giving his best efforts to promote it.

Another man who recognizes the possibilities of this phase of the industry, and who is using his official position to promote it, is Secretary of Agriculture Meredith.

Mr. Meredith points out that there are now twenty concerns engaged in the manufacture of by-products from cull oranges, from which during the past year 6,000,000 pounds of marmalades, jellies, etc., were made. In the lemon field, 1,500,000 pounds of citric acid were produced, 500,000 pounds of citrate of lime and 50,000 pounds of lemon oil.

These figures take no account of many hundreds of thousands of pounds of grapefruit marmalades, grapefruit juice and other grapefruit products which would add greatly to the figures given.

Mr. Meredith urges citrus growers and other citrus factors to unite for a still greater production of citrus by-products, and points out the great financial benefits to be derived from the promotion of this branch of the industry.

It is fortunate, indeed, for the industry when men of the standing of Mr. Sample in the industry and of Secretary Meredith in the administrative branch of government, interest themselves in the promotion of this important branch of citrus activity.

With the many important researches now being made into this subject and the numerous practical demonstrations now under way, The Citrus Industry believes that growers may confidently look forward to the day when culled citrus fruits will find a ready and profitable market at every citrus shipping center of importance both in Florida and California. Once this present waste is converted into dollars, the profits of the citrus grower will be more in keeping with the importance of the citrus industry as a factor in the fruit markets of the world.

Wherever you find a good citrus section, there you are certain to find good roads. Citrus growers are the most progressive class of agriculturists in the world.

MOTORIZING THE CITRUS GROVES

THE CITRUS GROVES are fast becoming motorized. This is a fact which is patent to even the most casual observer. Where formerly the horse and the mule, the man with the spade, the hoe or the rake were common sights in the citrus groves, today the tractor drawn plow and harrow are the rule. The horse and the mule are the exception, while the "man with the hoe" has largely disappeared from the groves.

But, while this fact is very patent and cannot be gainsaid, it is not entirely the result of choice on the part of all grove owners. In many cases, necessity has been the impelling force which wrought the transformation.

Scarcity of labor, the high price of labor, and above all, the inefficiency of the available labor supply, has played an important part.

Confronted by existing conditions, the grove owner found himself compelled to either reduce his holdings, neglect his grove or find some new method of caring for his trees and marketing his product.

Preferring to increase, rather than to decrease his grove acreage, equally determined not to neglect his grove, the ambitious owner sought relief in modern and quicker methods of caring for his trees and product. The tractor and the truck appeared to furnish the only practical means of attaining the desired end. Wherefore the tractor and the truck became permanent institutions on the up-to-date groves.

Of course there were pioneers in this movement as there are pioneers in every movement which tends toward advancement. And there were, at the outset, many skeptics, as ever there are and have been skeptics in every field of effort. But, as always, the pioneers won. They demonstrated the efficiency and adaptability of the new motive power to grove management and added surplus dollars to their annual income, while the skeptics continued to operate their groves at a smaller margin of profit.

Today there are few skeptics. The tractor and the truck have become established as permanent institutions on modern groves; are in fact a part of the modern equipment which the progressive grove owner demands. Necessity forced the innovation, but the tractor and truck are now an essential part of grove equipment as a matter of choice. They have demonstrated their efficiency and no large grove owner now thinks of attempting to handle his plant without the aid of these accessories.

THE RAILROAD PROBLEM

WHEN the railroads were turned back to their owners after a period of operation by the government, The Citrus Industry predicted that all would not be clear sailing, either for the railroads or the shippers.

An article in this issue by Mr. P. L. Waycoup deals with conditions as they exist three months after the return of the roads to private control. This article is so timely, so forceful and yet so sane, that it deserves the careful study of every reader.

Mr. Waycoup advances some ideas which may be rather startling, yet which, it must be conceded, are fully warranted by the present chaotic conditions in the shipping world.

The grower who held his crop this season has no reason to complain.

It may seem a far cry, but what will the grove owners do for shipping crates when we have exhausted our present timber supply?

PSYCHOLOGY OF THE PROFITEER

WHILE, to most of us, profiteering is a very pressing and material thing, it is in reality largely a creature of imagination. Not your imagination nor ours, yet none the less truly a creature of imagination.

It is a form of trade exaggeration based upon bogy fears rather than upon purposeful profiteering. It is like the child who hears a story of a bear. When he repeats it, it is two bears, and before the story has gone far among his playmates, the woods are full of bears.

So, the merchant gets wild rumors about future prices. He is urged to buy more than he needs because the price is sure to advance. He buys and puts his fears on the sales tag, and the consumer is forced to pay the price which the merchant fears will be the price in the near future. The consumer hears the rumor of a coming advance and he eases his conscience by the thought that The merchant sees that it is easy to sell at a great advance and he ease shis conscience by the thought that "the people want the goods at any old price—I should worry"—and he boosts them up another notch.

But how does the fear start? Who first brings the bogy from its hiding place in the dark to frighten everybody? Might as well ask which was first, the egg or the hen?

The consumers are largely working people. They buy recklessly and help keep prices up. Because prices are high, they must strike for higher wages. The threat or the fact makes the manufacturer advance the price of his goods to meet a real or fancied condition, and when a real advance of pay to the workers might advance the cost of the article two or three cents, the manufacturer tacks on a nickel and blames it to high wages.

The teamsters, the railroad men, the freight advances, all take a wee bit in advance, make a margin above increased cost, so as to safeguard against another rise. And so it goes. These little uncalled-for advances go toward the general charge of profiteering, not so much as intentional profits as insurance against what may happen in these times of price uncertainty.

While there is a real scarcity of some of the necessities due to slackened production, and while it is true that some are hoggishly and unpatriotically profiteering, the most of our troubles in fighting the H. C. L. are based upon fear. People no longer trust their own judgment, nor will they trust each other. They are like men in times of financial panic—uncertain as to what is about to happen, and bound to be on the safe side.

The merchants are as human as the producers. If they sell at a price which later advances, they figure that they have lost just so much money by not charging more, even though they have made a good profit on their sales. The grower who has held his crop and sees the price drop just as he is ready to let go, feels that he has lost real money, while in fact he may have realized a good profit even at the lower price.

The real trouble is that we have lost confidence—both in ourselves and others. When this confidence is restored, we will hear less of profiteers, even though, like the poor, they will ever be with us.

FOREST CONSERVATION

FOREST conservation is a subject which is given entirely too little thought by the landowners of the citrus belt and of the entire South. Accustomed as we have been to thinking of our forests only in terms of their value commercially, of how quickly they might be converted into coin through the medium of the saw mill or the turpentine still, we find it hard to realize that our forests are on the very verge of extinction, and that steps must speedily be taken for their preservation or replacement.

Even where we have not been concerned commercially in the devastation of our forests, we have been prone to look upon our woodlands as of no value; as nuisance, in fact, which must be cleared off before profitable farming of the land could be carried on.

So intent have we been upon the dollars to be obtained from the destruction of the forests, or the dollars to be expended in clearing the land, that we have forgotten what the destruction of these forests may mean; nay, must mean to the South in the years to come.

Cleared lands we must have for our groves and farm lands, it is true. But just as surely as we need these cleared lands do we need also many acres of tree covered lands, both for their influence upon climatic conditions and for our future use in commercial lines.

So important is this problem of forest conservation that we are devoting considerable space in this issue to an expert opinion from the pen of one of the best posted forestry men in the land. It should be read and studied by every thoughtful landowner and by every lover of nature and the beauties of nature.

Watch your grove for rust mites, spider mites and citrus scale.

IS THIS MAN HUMAN?

WE MET a man from New York state the other day who appeared to be so well satisfied with life and the conditions of life that we really wondered if he were human.

He had not a word to say about the profiteers. Prices, so far as his conversation went, were perfectly normal. There wasn't a thing the matter with the government nor the weather. Even the train service and hotel rates bothered him not in the least. In a railroad journey of a hundred miles with him as seat companion, not a complaint was uttered.

When told of the present satisfactory prices of citrus fruits and the increasing values of citrus lands, he appeared to be pleased, although his only interest in citrus conditions lies in the eating of citrus fruits.

"When I eat my grapefruit for breakfast," he said, "I am not thinking of what it cost, but of how good it tastes. If the citrus men are making money, I am glad of it. Everyone else is making money, and the citrus grower who feeds us with his fruits, should be getting his share."

Sound logic! Sound sense! Good judgment!

Yes; and yet how strange it sounded. So out of harmony with the common trend of popular conversation with a seat companion on a railway train. So strange, in fact, that we were led to wonder if he were really human.

Possibly not. Yet is it not possible that the world would be better off if there were more men like him? If we all could get his perspective and look at the world from his angle?

The grower who fails to "keep books" on his grove earnings and expenses is like the banker who would make a practice of loaning money on intangible assets. Bankruptcy is at the end of the road for either.

Every successful attempt to enlarge the field of citrus by-products means an increased profit for the grove owner.

CONTROL OF RED SPIDER

(Continued from Page 7)

affected parts take on a grayish, dry appearance, entirely different from the yellow spots caused by the attacks of the six-spotted mite.

The reddish-yellow eggs are glued to the leaves, where they are also held by a series of silken threads arranged in a peculiar fashion characteristic of no other species of the spider tribe. A silken stalk arises perpendicularly from the upper side of the eggs and to the top of this stalk are fastened fourteen threads of silk which run out in as many directions, like the guy-ropes of a derrick, and are fastened to the surface of the leaf.

The eggs hatch in a week or ten days and the young require about twelve days to acquire their full size. During this period they molt three times. The very young larvae have, like insects, six legs, but after the first molt there are eight, the typical number of the spider family. The female lives for about a month after reaching full development, and during this time she lays from thirty to seventy-five eggs.

Artificial Control

While, as above stated, a number of natural enemies prey upon the spider mites, greatly reducing their number, these alone cannot be depended upon to control the pest. The efficient control of spider mites, as in the case of rust mites, calls for constant vigilance. Wherever a tree is found to be infested, it should receive prompt and special attention, and all trees in the same grove should be carefully watched for the spread of the mites is very rapid. Spraying should be done as soon as the presence of the pest is detected, and frequently two or three sprayings will be required, the first to kill the full grown mites and larvae, and the others to control the eggs which may later be hatched.

Sulphur Best Insecticide

Like all members of the spider class, the spider mites are very sensitive to sulphur. Sulphur does not kill the eggs but, as it remains active on the trees for many days, it kills the young mites as they hatch. It is not necessary that the mite be actually hit by the sulphur; the sulphur slowly oxidizes on the tree and will kill all mites within a radius of a small fraction of an inch. It thus becomes a sort of fumigation process. Indeed, in some sections of California, fumigation rather than spraying has been adopted as a means of fighting this pest.

In spraying for spider mites, one may use either free sulphur or some of its compounds, applying it dry or in the form of a spray. Free sulphur is one of the best remedies against red spiders or mites. It is somewhat slower than some of the compounds in its action, often requiring two or three days or more to do its work, but it remains active for a long time, frequently two or three weeks, and usually kills the mites. Sulphur can be applied dry and can be driven into the citrus tree by means of a blower or duster.

It is usually considered better to mix three parts of dry sulphur with one part of hydrated lime. The lime can be bought or made by adding four gallons of water to every 100 pounds of quick lime. Mix the hydrated lime and sulphur thoroughly. Best results will be obtained by applying the dust at night or in the early morning when the plants are wet with dew, as the dust adheres better at that time. It works better when the nights are moist and the days bright and sunny, as under those conditions the decomposition of the sulphur takes place more rapidly.

As a spray, from one to five pounds to 50 gallons of water can be used. It will spread and wet the plants much better if three or four pounds of soap are added.

Sulphur Compounds

Of the compounds of sulphur, lime-sulphur is one of the best for use in the citrus grove. Use about one gallon to 70 or 75 gallons of water. The grower can make his own lime-sulphur by boiling lime and sulphur together, but this does not ordinarily produce as good a compound as the commercial product which is made in large quantities and boiled with live steam. There are several reliable insecticide houses in the state which make reliable compounds, and the products of these concerns is generally preferred by growers to making their own spraying materials.

Aside from its insecticidal value, lime-sulphur seems to act as a stimulant to the fruit, increasing its size and hastening its maturity, causing an earlier ripening of the fruit than where this solution is not used.

Oil emulsions also are sometimes used in controlling the spider mites, but are not generally as effective as the lime-sulphur compounds, as only the mites which are struck are killed, while those which may be close to it but remain untouched by the spray, are not harmed. A commercial product, "soluble sulphur" or soda-sulphur, is sometimes added to the oil emulsions to make them more effective against spider mites. Either of these compounds is sometimes used alone in place of the lime-sulphur.

Fumigation, as practiced in some parts of California, is said to have been unsatisfactory in that it greatly reduced the number of natural enemies of the spider mites, while not materially affecting the mites themselves. The larval and adult stages of the beneficial insects were killed by cyanide gas. Instead of proving beneficial, the fumigation process is said to have actually increased the number of the spiders by reducing the number of natural enemies which appeared to be more susceptible to the effects of the fumigating gases than the spiders themselves.

CITRUS EXCHANGE NAMES OFFICERS

The annual meeting and election of officers of the Florida Citrus Exchange took place recently in Tampa. The following were chosen for the ensuing year:

President, J. H. Ross; first vice-president, D. C. Gillett; second vice-president, J. W. Ponder; secretary, C. E. Stewart, Jr.; additional directors, H. G. Putnam, A. G. Hamlin, J. E. Kloch, R. L. Collins, P. C. Peters, W. W. Raymond, C. E. McCormick, and associate directors, S. C. Warner and B. F. Randolph. Three members of the old board retired: G. W. Wakelin, Edwin Parkinson and G. H. Duggins, being succeeded respectively by Messrs. Collins, Raymond and Randolph.

President J. H. Ross was renominated by D. C. Gillett of Tampa, his election was unanimous, as was the election of the vice-presidents and secretary, and the selection of William Hunter as counsel, and W. H. Covode as cashier.

J. L. Daniel of Tennessee Buys Four Groves

J. L. Daniel of Chattanooga, Tenn., purchased through the Rupert Smith Real Estate Agency of Arcadia, four groves from W. J. Willingham, located in the counties of Seminole, Orange and Lake. These are fine properties and Mr. Daniel is to be congratulated upon his acquisitions.

Moffett Grove Sold to Lakeland Man

Dr. Watkins of Lakeland recently purchased the Moffett grove on Lake Griffin about a mile east of Leesburg. This is a handsome piece of property and while the price was not made public it is understood that it is a rare bargain.

Spray With Paraffin Oil for Citrus Scale

Citrus scales and whiteflies present but a single problem in bearing groves where both are present, as the best insecticides for the one are the best for the other. Furthermore, J. R. Watson of the University of Florida experiment station says that a heavy infestation of whiteflies is likely to be followed by a marked increase in the number of scales present, particularly the common purple scale.

The reason for this relation is that the sooty mold which grows in the honey-dew given off by the whiteflies acts in part as a protection to the scales. In their efforts to avoid light, the young scales crawl under anything that affords them shade, as the calyx of the fruit, or into the shadow of a fruit when two are touching. A loosely-fitting covering of sooty mold makes an ideal retreat.

In the majority of groves, where both whiteflies and scales are present, the spraying schedule should be adopted primarily to the whiteflies. There are three main broods of the common whiteflies and the grower should take measures to combat each brood. Spraying is best done when the insects are in early larvae stages, for two reasons; the larvae are more easily killed at that time, and the injury they would inflict during their growth is prevented.

Mr. Watson says the dates of emergence of these broods vary with the year, the grove, and the latitude, but in general, the adults of the first brood are mostly on the wing in March and early April, of the second brood in June, and of the third brood in August. One should record the date when the flight of the adults begins to abate, wait ten days, and then spray. The ten-day period gives the majority of the eggs time to hatch. The spring spraying should be delayed until the young oranges are at least as large as hickory nuts, to avoid injury from the oil used. This will bring the spring spraying early in May, on the average.

In the fall, again ten days after the main flight of adults is over, the grower should spray with the oils. This time for spraying will usually come in September.

These two sprayings with insecticides will usually suffice for a bearing grove. In a young grove, where the fungi do not thrive on account of a lack of shade, the grower may need to spray again in July. If the scales, particularly the red scale, have become abundant, two sprayings may be necessary.

The best insecticides for both these pests are the paraffin oils. Spraying must be thorough. Although the whiteflies are confined chiefly to the undersides of the leaves, the scales are found on all parts of the trees.

Under normal weather conditions the summer broods of whiteflies and scales, greatly reduced by the May spraying, can usually be controlled by the parasitic fungi. At the beginning of the rainy season the grower should spray into his trees the spores of the red and brown whitefly-fungi, and the black, red and gray-headed scale-fungi. The red one can be obtained from the State Plant Board, Gainesville.

Finish Planting on Big Cecilwood Grove

One of the big grove projects which has just been completed so far as the planting is concerned is that of the Cecilwood grove at Haines City which is the property of C. C. Spencer of Pittsburg, Pa., and Harry E. Johnson of Haines City.

This grove contains 320 acres and is but one of many new groves which have been set out in the "Ridge" section of Polk county during the spring planting season.

Speaking of the completion of this extensive planting project, the Haines City Herald says:

"Work of clearing the 320 acres was started May 13, 1919, proving that Mr. Johnson was too busy to be superstitious, the entire tract being cleared and 120 acres of it plowed in 130 days, which we believe established a record for such work in this section. In connection with the clearing 2100 railroad ties were cut from the timber and 10 cars of veneer blocks cut and shipped to crate mills. A fine fence encloses the entire planting, built with Red Island Cedar posts which are guaranteed to last 40 years. A good barn has been built and a house provided for the convenience of the ffeld foreman and everything is in shape to cultivate and care for the grove properly. Roads are laid off on the section and half section lines and although not improved are passable. As the country beyond is developed they will no doubt be surfaced and the entire tract be within easy reach of railroad and packing house.

"In clearing a tract of about three acres was left on one of the lakes adjoining, on which only the underbrush was cleared, leaving live oak, hickory and magnolia trees, the idea being to improve same into a picnic ground or park which will bear the name 'Cecilwood Park.' One large oak is four feet through and the park gives promise of being a beautiful spot and no doubt when completed will be a popular outing place. The tract as a whole is ideal for citrus culture being high and rolling and having good water protection as it overlooks and runs down to three lakes. It lies just northwest of town and is a little higher than the townsite which, by the way, is not considered low being 'on the ridge.' It is our understanding that it will be kept in one piece and cared for as a whole by the present owners until it is six years old before any of it is placed on the market.

"In selecting the trees great care was taken to get only the best, both in quality of trees and in variety planted. All trees planted were furnished by a local concern, the Haines City Nurseries, of which O. H. Ohlinger is the proprietor and nothing but oranges and tangerines were set out. Six hundred are Lue Gim Gong, 1200 Valencia, 2340 Pineapple and 1600 Tangerines, which seems to be a good selection, providing fruit for the market over the whole shipping season.

"Considering labor conditions the past year, the work of clearing, fencing and planting an acre a day, which is the average, is regarded as quite an accomplishment and the owners no doubt feel satisfied with what they have done and with the prospects they have."

Tractor Experience and Efficiency

By A. R. Pratt

It is extremely fortunate for the owners of citrus groves that gas tractors first came into use in other sections. Fortunate because the first use of tractors in farm work was largely experimental and many defects found to exist in the early makes of tractors had been discovered and rectified before the imperative need of tractors in grove management became manifest.

When the citrus grower felt this need, the tractor had passed beyond the experimental stage, and while it was found necessary to make some modifications to meet local grove conditions, the efficiency of the tractor as a practical machine for general farm and grove work had been fully established.

Gas tractors first came into general use for farm work in the northern portion of the great plains states. Their introduction came when large tracts of the virgin prairie land of that section was being opened up for settlement. Plowing by horses was both tedious and expensive, as both horses and feed were scarce and high priced.

These gas tractors were heavy and cumbersome, but of great pulling power, one outfit frequently pulling from 12 to 24 breaking plows. The equipment called for a large outlay of capital, but appeared to afford the only means of preparing this virgin soil for flax or wheat at a rapid rate. The speed and ease with which work could be done attracted many farmers and thousands of settlers borrowed money to purchase tractor outfits.

However, these gas tractors, which had been introduced under seemingly favorable conditions, were soon discredited, and many of them were in a few years succeeded by horses. This was no doubt due to defective construction of the early models and to a total lack of knowledge of operation on the part of purchasers. The machines were subjected to abuse through ignorance of their mechanical construction and lack of understanding of their capacity and endurance. Neglect also played an important part in bringing many of the early machines to an untimely end in the junk heap.

Fortunately, the experience of these early machines was such as to teach manufacturers the need of remedying the defects, and as a result of this experience, the improvement in tractors was very rapid. Then, too, manufacturers took greater pains to see that purchasers of tractors were given the elementary instructions necessary in the operation and care of the machines.

Along with the improvement in construction came smaller and less expensive machines and those adapted to use on the smaller farms and in the groves and orchards. Thus it was that by the time the scarcity and high price of labor made it imperative that the large grove owner should seek some substitute for hand work and the mule, the tractor had been so modified as to meet the requirements of his work.

Timeliness in getting grove work done is an extremely important factor, and in this particular the tractor is distinctly superior to the horse or mule, as the tractor can be kept at work for long hours during the rush season and its efficiency is not impaired by hot weather. The saving in man labor is important, and it frequently makes it possible for the grove owner to care for his trees during much of the season without the aid of hired help.

When the proper tools are used and a skillful operator is employed the quality of the work is usually decidedly in favor of the tractor. Under conditions which exist in the citrus growing sections, grove yields are very materially influenced by the distribution and conservation of moisture. In order to prevent excessive evaporation and guard against the formation of an impervious plow sole which interferes with the proper distribution of the soil moisture, many soils, whether cultivated by horses or by tractor, should be cultivated as deeply as may be done without injury to the roots of the trees. This can be better and more cheaply done by tractor than by horse or mule power.

In the management of citrus lands it is frequently desirable to work up the ground under the trees. In former times this was accomplished by hand labor, and was a slow and painful process. Under present labor conditions such a method of cultivation is out of the question. But the tractor furnishes the solution. During recent years many grove owners both in Florida and California have kept the ground under the trees in a good state of tilth by the use of proper machinery drawn by tractors. The results secured have not only been more satisfactory than by the former method of hand labor, but the cost of such cultivation has been greatly reduced.

Under proper tractor management, the land may be handled somewhat more cheaply by tractor power than by mules, but the greatest advantage to the grove owners, as in the case of other grove machinery, lies not so much in reducing the cost for a unit of work, as in the fact that it makes it possible for one man to do considerably more and better work within a given unit of time.

A comparison of cost and efficiency between the work of the tractor and the work of the mule, has ever been to the advantage of the tractor. It is simply a matter of securing the tractor particularly designed for the work in hand, the use of the right implements in connection with it and the application of intelligent methods of management.

How long will a tractor last? Is a question often asked, and the answers vary about as widely as the number of men essaying to answer. Scores of things, some of apparently trivial value, enter into the life of a tractor. It must be well made. It must be intelligently handled. It must be properly housed. It must receive care and attention as to lubrication. It must not be overloaded or overtaxed. Each and everyone of these things, and a score of others not mentioned, must be observed if the tractor is to attain its maximum age and retain its maximum efficiency.

But, granted that the tractor possesses the fundamental qualities and is given proper and intelligent care in operation and is properly protected during its periods of vacation, the length of its life is still somewhat problematical. Many owners of tractors in the middle west, where farming operations cover but a brief portion of the year, estimate the life of their tractors at from seven to ten years. These tractors, probably are not in use to exceed 50 or 60 days during the entire year. In the citrus sections, where tractors frequently are in daily use for from 150 to 180 days a year, it is natural to suppose that the length of service would be shortened. But with tractors, as

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The Use of Tractors in Grove Cultivation

By J. H. Dew, President Florida Tractor and Implement Co., formerly U. S. Dept. of Agriculture.

The most important work in an orange grove is the cultivation during the spring and early summer months. It is vitally important that grass and weeds be kept down in the groves and that all moisture be conserved for the use of the growing trees. It is at this time of year that recently planted trees are getting set to the ground, getting their roots established and putting on their first growth. Among the older trees this time of year shows not only new growth but also the setting of the fruit for the year's crop. Consequently all trees, both old and young, need all available moisture.

The other main reason for the necessity of rapid and frequent cultivation in the spring is the keeping down of grass and weeds so that they will not use up the fertilizer which has been put in for the use of the trees. Therefore, cultivation must answer two purposes. First, the breaking up of the capillary tubes which pump the moisture from the soil into the open air and second, the destruction of grass and weeds which are using up the fertilizer in the soil that ought to be left for the use of the trees.

Taking into consideration the two-fold purposes of cultivation, the question of the proper implement to use is of great importance. Having been interested in this line of work while with the United States Department of Agriculture, I have paid especial attention to this and have conducted experimental work all during this year.

The pulverizing harrow has been the standard cultivating tool for use in orange groves for the reason that it leaves a perfect dust mulch. The pulverizer, however, falls short should the ground be covered with grass or weeds. The most perfect implement for use in cutting grass and weeds in a grove is the disc harrow, but in times past the use of the disc harrow was limited, owing to the fact that if the disc was set at sufficient angle to pulverize the soil, it went too deep and cut off the roots of the trees. Then too, the disc harrow, if a horse drawn implement, moved so slowly through the ground that it did not leave a perfect dust mulch.

In the experimental work conducted during the past spring, all types of work with both horse drawn and tractor drawn implements was observed. After a considerable period of time we found that we had evolved an almost perfect cultivating implement. This implement consisted of the regulation 32-18 tandem disc harrow, equipped with depth gauges which will absolutely prevent the disc from cutting more than three or four inches deep, drawn behind a tractor running at the rate of four miles per hour. When the implement was handled in this way the disc not only cut up all grass and weeds which were on the ground but the speed at which the implement was drawn had the effect of lifting up the soil particles in a steady stream and spreading them out so that a perfect dust mulch was the result.

This result can not be secured with the use of horse drawn implements because it is the speed at which the implement goes over the ground which enables it to lift up the dust particles and spread them out in a mulch on top of the soil. The depth gauges, of course, can be used on horse drawn implements to prevent the discs from sinking through and cutting the roots but the work is 100 per cent more efficient when done with the tractor.

The tractor business of Florida has had a "black eye" in the past but is now coming into its own. In former years tractors were sold mainly by factory representatives whose object was to get the tractor on the ground and get the money. Consequently, a great many useless and worthless machines were dumped on the people. At the present time, however, there are several firmly established local firms who maintain a stock of parts and machines which are practically sand and dust proof. The present cost of labor and stock feed makes it almost prohibitive to cultivate ground with teams and now that the proper equipment for this work has been worked out for use in connection with tractors every grove owner should be interested.

After experimental work was conducted, a comparative test was run for a period of sixty days on the ridge in Polk county, during which time a tractor pulling an eight foot tandem disc with depth gauges, averaged cultivating thirty-five acres per day.

In an adjoining field the same implement drawn by eight mules was able to cover but seventeen acres per day. Therefore, you can readily see that the tractor was 100 per cent more efficient in the amount of work done. The cost of operating the tractor, including the driver, averaged ten dollars for a nine-hour day. The cost of operating the team for a nine-hour day averaged fifteen dollars. Therefore, the work of covering one-half the ground covered by the tractor cost 50 per cent more than the operation of the tractor for a full day. In addition to all of the above advantages of the tractor over the horse drawn implement, a perfect dust mulch was left by the implement when operated by the tractor.

The day of the tractor has come to stay. Machines are being made adapted to Florida conditions and the sooner the grove owner ties up with a reliable tractor, the greater his profits are going to be.

TRACTOR EXPERIENCES AND EFFICIENCY

(Continued from Page 12)

with any other machine, manufactured or animate, it must be remembered that it is not so much the actual wear of labor as neglect and abuse which tends to shorten life.

But even if the life of a tractor were not more than five or six years, it would still make a most favorable comparison with horse or mule power when original cost and cost of maintenance alone are considered, to say nothing of the greater speed and efficiency of operation.

The tractor has become a part of the life of the modern citrus grove. The perfect machine may not yet have been made, but improvements are being constantly added to meet conditions as they arise, and never again will the big citrus grower be content to manage his grove without the aid of the tractor.

J. H. Sadler of Mount Dora, president of the Highland Citrus Sub-Exchange, has started the ball rolling in Florida apropos the co-operative care of groves among the co-operative associations. This has proven so successful among certain California associations it would seem well worth trying in Florida.

Breaking-in the Tractor

By H. W. Turner

More tractors are injured during the first two weeks of operation than during the rest of their lives. It starts out with the exclamation, "We got 'er started and for Heaven's sake don't let 'er stop," and so "she" is tried on every implement on the farm. Such a practice will put the machine in for a complete overhauling in two days' time.

If the tractor field grows during 1920 as it did in 1919, over five thousand new tractors will start to work on Iowa farms alone during the next eleven months. Other cornbelt states will each use about as many. It is for the owners and operators of these new machines that we take up this discussion—to enable them to get the longest life out of their machines. A new tractor is very similar to a span of three-year-old colts—practically unmanageable by the driver and unused to work. One of the first things for the operator to do is to become acquainted with his tractor. Study and learn its ways for good judgment is one of the keys to success in tractor operation.

The instruction book that comes with each machine will be found an invaluable guide in tractor operation. It is even more important to know the characteristics of one's tractor than it is to know the traits of one's horses. Study the tractor book, follow its recommendations and preserve it for further reference in time of need.

We are taking it for granted that the machine is to be taken from the local retail house. Thus it is unloaded from the car, the grease cups filled, water put in the radiator, fuel in the tank, and lubricating oil wherever required. From this standpoint the operator starts for home. The trip should be slow and marked with frequent stops. He should acquaint himself with the different levers, throttle and adjustments, in other words "break the tractor to drive."

No one is in a position to make alterations in a machine that he does not know. If a noise that does not seem right develops, stop and locate it, perhaps something has worked loose, or a stray cotter pin has dropped in an enclosed chamber which, if unhampered, may cause havoc in a short time. Stop frequently, even if all running seems to be smooth; walk around the machine and place your hand on all external moving parts to see how the bearings are. It may be that a grease cup hole is plugged or perhaps the local dealer neglected to fill one grease cup. It is also a good policy to stop the motor after which try to turn the engine over, noting whether the pistons have a tendency to stick. If not, one is safe in starting up and continuing the journey home.

If some parts are overheated, grease properly or let the motor cool if the trouble is there. All tractors upon leaving the factory have the bearings fitted very tightly. If this were not the case the engine would soon develop numerous knocks and pounds and shorten the life of the machine considerably. Hence the first thing to do with a tractor is to properly burn in the bearings. If "burned" in too rapidly, they will heat and ruin the bearings.

Here is one instance where we should treat the new tractor like the colts previously mentioned. No horseman would think of taking four colts, just broken to drive and hitch them to a plow the first thing, with the intention of seeing how deep he could plow and how long he could continue it before the colts would "lay down." It would be just as logical to expect a tractor to stand up indefinitely if we put it to the extreme test before it was properly "broken in." Just as overwork "sweenys" the unconditioned colt, so overwork will "sweeny" the tractor. The writer knows of many instances where tractors were badly damaged in the first day of operation. A tight bearing may heat the babbit sufficiently to clog the oil-hole, thus burning out the bearing in the following day or week. Scored cylinders can also be often traced back to the first day's operation, besides cutout transmissions.

While the operator is becoming acquainted with his machine he should let the tractor run moderately on no load. Then start in by hauling light loads, perhaps bringing in such machinery as was left standing in the fence corners last fall. They need overhauling, which can be best accomplished near the farm shop. By the time the implements have all been brought in, some light belt work can be taken care of, such as sawing wood, grinding feed, pumping water and the like.

After a day's running at such work, field work can be undertaken. However, the operator should first ascertain that all bearings are running cool; a hot bearing indicates one not completely fitted. Investigate to see if it is getting lubrication.

A point, more important from the standpoint of crop production than that of the tractor, is, that one does not want to plow very much deeper at any time than is customary. There is a solid bench below the regularly plowed level which is extremely hard and somewhat void of plantfood. Hence if much of this material is turned up the crops are going to suffer for several years. Thus the best policy is to plow about one inch deeper the first year and increase that much each year until the desired depth is reached.

One point that cannot be over emphasized is that of lubrication, especially for the new machine. Use a good grade of oil—that recommended in your instruction book. The tractor manufacturers know what oil is best for their machine, so follow their suggestions. If the lubrication system of the motor is one wherein the oil is used over and over again, it should all be drained out and new oil used after the first eight hours of running. Repeat this for the first four or five days as "burning" bearings discard a great deal of mineral matter, which if it comes in contact with bearing surfaces, will rapidly cut. There is also the danger that such refuse might lodge in a fuel pipe, eventually clogging the pipe and cause considerable wear on the affected bearings. Keep the transmissions well greased and keep the grease cups well packed. Remember, lubrication is cheaper than machinery. After working smoothly keep the tractor busy. While not in the field have it purring away on the belt. The machine is a labor saver, whether horse or human, hence the more work the tractor does the greater is the saving financially.

A considerable percentage of tractor trouble is due to overloading. An overload causes the motor to slow down, hence less work is accomplished. This is evidenced by the sound of the exhaust and is easily recognized. A tractor has so many foot pounds work in it. If work is required in overcoming heavy fric-

(Continued on Page 20)

Preservation of Grapefruit Juice

By E. M. Chase

Fruit juices vary greatly in the manner in which their flavors change upon sterilization. Some juices can be heated sufficiently to sterilize them with only a slight modification of the fresh fruit flavor; others must be guarded carefully against overheating or their flavor is so modified as to become objectionable. No fruit juice has precisely the same flavor after sterilization that it had before, although some juices can be boiled for several minutes without developing an objectionable flavor.

The flavors of citrus fruit juices are very evanescent, and the usual methods of sterilization are not successful in their treatment. Every precaution must be taken not to overheat or unevenly heat these juices, as they rapidly develop a "cooked taste," where heating is either too high or too prolonged. For this reason, few methods where the juice is heated in the bottle have been successful with citrus juices. Where such methods are applied, the juice nearest the surface of the bottle becomes thoroughly sterilized before that in the center is sufficiently heated, as a result of which the product usually acquires an off-flavor. Keeping the bottle in motion tends to reduce this overheating, but does not produce an altogether satisfactory product.

After a good deal of experimental work, the following method, which overcomes this difficulty of heating, has been devised and tried out with grapefruit juice. The resulting preserved juice has been found much nearer in flavor to the original than most sterilized juices. It is entirely free from any "cooked flavor," holds its own flavor well, and remains clear indefinitely. The details of the method have not been worked out as yet on other citrus juices.

The Method

Use only good fruit. The juice is not improved by sterilization, and badly flavored or sour juice will retain these characteristics after being bottled. Wash the grapefruit, cut it into halves or quarters and extract the juice by means of a fruit press. The ordinary type of cider press answers very well, although it is best to enclose the fruit in a cloth container in order to strain the juice. Where trouble is encountered with the essential oil from the rind, it should be removed by passing the juice through a centrifugal cream separator. While this oil may not seem objectionable in the fresh juice, it often develops a rancid flavor in the product on standing.

The fruit should not be cut into too small pieces or ground. The more it comes into contact with the peel, the more bitter will be the flavor. For the same reason, it has not been found practicable to remove all of the juice possible by increasing the pressure. The juice obtained under very high pressure has a tendency to be bitter. It has not been found satisfactory to peel the fruit before pressing it, as the juice comes in contact with a large surface of the white rag which is left clinging to it no matter how carefully the paring is done. This rag gives up its bitter flavor to the juice. It has not been found necessary to remove the seeds before pressing, even from the heavily seeded strains.

Sterilizing the Juice

Sterilize the juice as quickly as possible after it has been prepared, using a continuous pasteurizer.

A small apparatus consists of a coil of ¼ inch silver tubing, 8 inches long, 2 inches across, with a space of ¼ inch between the folds of the coil. This coil is set in a small tin-plate boiler in such a way that it can be entirely immersed in water. The ends of the coil should project through the sides of the boiler so that connections may be made with the juice reservoir and the final receptacle. The bottom of the boiler is left free for the application of heat. While this apparatus is small, a surprisingly large quantity of juice can be passed through it if the juice reservoir is kept under some pressure or placed well above the sterilizer. For an 8-inch coil, 2 gallons per hour is about the limit when the temperature is brought above 90° C. A larger capacity can be obtained by increasing the length and diameter of the coil and the pressure on the juice tank. Copper tubing can be substituted for silver, if care is taken to keep the inside of the tube clean. Coatings of copper oxides or salts are readily dissolved in fruit juice, giving it a metallic taste.

The juice is piped from the reservoir to the bottom of the coil. Means of regulating the flow should be provided for in this line. As it leaves the coil at the top, it is run into a small enclosed thermometer receptacle, where the temperature can be taken. With grapefruit juice the sterilization temperature may run as high as 85° C. without deleterious effect, if the time of heating is kept between 5 and 10 seconds.

Bottling the Juice

From the sterilizer, the juice goes at once into sterile bottles, the 5 to 10-gallon size being most convenient. Fill the bottles well into the neck, and tightly close them with sterile corks. Place the filled bottles in cool storage, from 40 to 50° F. being a satisfactory range of temperature, and allow them to remain there until all the sediment has deposited in the bottom of the bottle and the supernatent juice is clear.

Filtering

Decant or siphon the clear juice from the settlings and mix it in the cold with not over 2 pounds of Kieselguhr (infusorial earth) per hundred gallons. Treat the residues in the same manner, using sufficient Kieselguhr to secure rapid filtration, usually between 5 and 10 pounds per hundred gallons. Then filter the two lots through cloth. An ordinary rack and plate press under pressure was used in the experimental work. A press, 6 inches square with 12 racks, will filter 5 gallons per hour. A small iron press has been used with satisfactory results, but it was varnished repeatedly with a water-proof heat resisting varnish.

The Kieselguhr should be carefully selected and tested out by actual trial, as some grades are worthless for this purpose. It was found best to wash it several times with boiling water before using, to be sure to rid it of any earthy taste.

Final Bottling

The filtrates from the press can now be mixed and sweetened or blended to taste. It is not a bad plan to bring each batch of juice to a definite percentage of solids before bottling. It was found that from 17 to 20 per cent is about right for a juice containing more than 1 per cent acid. Either ordinary cane or commercial invert sugar can be used for this purpose.

Blending with other fruit juices often adds to the quality of the product. A blend of 15 to 20 per cent loganberry with 80 to 85 per cent, grapefruit has been found quite satisfactory. While this was most fa-

Our Forests a Great Resource That Should be Preserved

In spite of repeated warnings, the people of the South, indeed the people of the entire nation, have been inclined to look with complacency on the rapid destruction of our forests. This destruction, accompanied by inconceivable and almost criminal waste, has progressed to the point where even the most unobserving are now compelled to face the seriousness of the problem.

Citrus growers are as vitally interested in the proper conservation of the forests as an other class of citizens. Indeed, in many respects, being themselves dependent for many supplies upon the forests, they are more vitally concerned in the preservation and reproduction of forests than many other classes.

Inherited wealth is easily spent, and many a man has awakened too late to the fact that his wealth, unlimited as it may have seemed at one time, was gone. This may also be true of a nation, and perhaps we may find ourselves in that position with reference to our timber resources, unless we install a new accounting system and use only the interest on our natural resources and not the prinicpal, as we have been doing.

Man is dependent upon trees for more than he perhaps realizes, and the wonderful development of the United States has been made possible, in large part, by our forest resources. But we have retained too much of the attitude toward our forests assumed by the early settlers, who looked upon the trees as their natural enemies, because they had first to be cut down, with much labor, before the land could be used for crops. Nature intended that trees should be used to meet the needs of mankind, and when a tree has reached its maturity its chief value is for the lumber it contains, but that lumber should be utilized to the fullest extent and unnecessary wastage should be avoided.

Timber cut from our public lands, such as are included in national forests, is managed under plans which aim at the full utilization of the timber consistent with encouraging the natural reproduction of the cut-over area, but when it is considered that 98 per cent of all sawmills are operated on private lands, and that private owners hold four-fifths of the standing timber of the country, with no check upon their operations other than that of self-interest, we have no definite assurance that our great wealth of timber resources will be so managed as to provide a perpetual supply of lumber, as they can and should be.

Prof. Henry S. Graves, head of the United States Forest Service, who has devoted a great deal of time to a study of our private forestry problems, has, on numerous occasions, expressed himself forcibly on the necessity for deciding upon a definite policy of constructive public action that will bring about the right handling of our private timberlands. He points out that our country is progressively destroying its forests, and that the consequences are far-reaching. The exhaustion of the forest is followed by the closing of industries, the steady increase of waste lands, the abandonment of farms that depend for their market on the lumber companies, and the impoverishment of many regions.

No section of the country can afford to have a large part of its land an unproductive waste, with the loss of taxable values, of industries, and of population that would be supported if these lands were productive. No section can afford to be dependent for its supplies of wood products on another section from one to three thousand miles away.

It is said that the original supplies of pine in the South will be exhausted in 10 years, and that within five to seven years more than 3,000 mills will go out of existence. Already there is an acute problem of supplies for paper mills and for other industries in the east which use specialized material. Pacific coast timber is entering the eastern markets. This means that the price of home-grown timber has risen to a point making it possible to ship timber 3,000 miles in competition with it.

The experience of the war called sharp attention to the condition of our remaining timber supplies. The bulk of the material for general construction was obtained from a few large centers of original forest, often involving long rail hauls and high cost. Extreme difficulty was experienced in obtaining promptly an adequate supply of specialized products, like some of the high-grade hardwoods.

About 30 years ago New England was not only self-supporting in her timber resources, but exported large quantities to other parts of the country and abroad. Within the last 15 years New England has become an importing region and looks more and more for timber supplies to the lake states and even to the Pacific coast. It is estimated that fully 30 per cent of all the lumber used in New England now comes from outside the region. New England is one of the important centers for wood-using industries. Heretofore many of these industries have drawn upon local supplies. It is estimated that the annual growth in New England of forest materials that will be suitable for lumber or other higher uses is less than half of what is being cut. These facts vitally affect an industry with over $300,000,000 invested and employing over 90,000 wage earners.

That the conditions now existing in New England could be materially changed by a change of forestry policy is shown by contrasting the lumber industry there with that of France. The forested area of New England, amounting to about 25,000,000 acres, is about the same as that of France, and in many respects the forests are similar in character. France is producing by growth each year 50 per cent more than New England. She has for years been improving her forests and approaching a point where she can furnish most of her domestic needs. New England by progressive diminution of capital stock and failure to produce new forests is going in exactly the other direction, losing ground every year. Before the war France was importing about 80,000,000 cubic feet of lumber per annum, and New England's imports exceeded that amount. The forest and wood-using industries of France furnished employment to over 700,000 persons, and because the forests were handled in a way to keep up production by growth this employment was permanent. It was the small industries supported from local forests that furnished employment to so many people.

Prior to the war, England, with her great merchant marine, did not consider it necessary to develop her own small forest supplies, but the war taught her how valuable local sources of wood supply might be in times of emergency, and she is now working on a vast plan of reforestation, by which over a million acres of land will be planted to trees during the next forty years, at an expenditure of over $17,000,000. England's colonial policy in India has resulted in the establishment of the finest and most effective system of forest fire protection in the world, and much of our own work along that line is based upon the India program.

The conditions in New England are reflected in other parts of the

country. We are still drawing upon original timber for our chief national needs. We are not providing for a proper replacement of the old stock by new forest growth. Most of the private timber is cut without any regard whatever for replacement. Destructive processes are permitted that retard or actually prevent the succession of a good forest growth. Remnants of culled forests and patches of second growth are for the most part not being protected. We are failing to produce by growth the materials that will be needed for local industries, needed to make a large part of our land useful to the state and community, needed to prevent one part of the country becoming dependent on another far-distant part, with the inevitable burden of high prices.

Timberland owners feel that they cannot change their present methods. They have purchased the land to exploit the timber and not to grow a new crop of trees. Most of them do not intend to hold the lands after they have taken the timber from them and they do not see why they should expend money or effort on the land for the benefit of the public.

In advocating a new policy of forest protection Professor Graves states that a national policy of forestry should seek the protection and beneficial utilization of our present forest resources, the renewal after cutting of forests on lands not needed for agriculture and settlement, the stability of forest industries and of satisfactory conditions for forest workers, and the restoration of forest growth on lands now unproductive and idle.

The public interests in the continuance of forests justify and require direct public ownership of extensive areas, and also participation by the public in working out the problem of protection and renewal of private forests. A program of forestry for the nation should include action by the public through the government and the states, action by landowners and operators, and the means of uniting the efforts of all for the achievement of a common purpose.

A national policy must recognize the problems of the private owner of forests. Greater security of forest property from fire, better returns from timberland in the long run, and more stable industrial conditions must be sought.

According to Professor Graves, the Federal holdings of timber lands should be extended by purchase, by exchanges of stumpage for land, and by placing under permanent administration forest lands now in the unreserved public domain. Areas needed for the protection of water resources, to prevent erosion, for recreation and other general public purposes, should be acquired where not now owned by the Federal government. The acquisition of cut-over lands by exchange for stumpage would serve to consolidate and block out national forests in the West.

The states should establish public forests, with the same general objectives as the Federal government, and with special reference to the economic and industrial needs within their boundaries. Many western and southern states still own forest lands received in previous grants from the government. These should be placed under permanent forest administration, with provision for the settlement of areas suited to agriculture. Lands reverting to the states for taxes or otherwise should likewise be retained, wherever practicable, and used to build up permanent public forest reservations.

In many cases, municipalities should establish public forests or woodland parks to protect the local water supply or to serve as public recreation grounds.

To encourage the proper management of the private forests it will undoubtedly be necessary to have the participation, liberal co-operation and direction of the public in working out the problems involved. An effective system of fire protection must be worked out, and the cost of this protection should not fall entirely upon the shoulders of the private owners, for the public will be benefited thereby and should share in the burden.

The renewal of forests on all lands not needed for agriculture and settlement is an essential feature of a national policy of forestry, and an effective program should be worked out in each state, backed by appropriate legislation and efficient administration, which will achieve this object on private as well as on public property. As in the case of the fire protection, forest renewal on private lands requires the participation and aid of the public.

There are two problems of forest renewal; first, the restocking of lands already cut over and now in a condition of waste, and second, that of providing for natural reproduction when the timber is cut. Where there are still seed or seed-bearing trees on cut-over lands, continued fire protection may in many cases suffice for restocking. Where there is no chance for natural reproduction, planting or sowing will be necessary. The public will have to take over a large proportion of these cut-over lands and restore them to productivity. In some instances, if properly encouraged and protected, the owners may be induced to restock their waste land as a business undertaking.

PRESERVATION OF GRAPEFRUIT JUICE

(Continued from Page 15)

vored, both pomegranate and pineapple juice can also be used with excellent results.

Now return the juice to the juice reservoir, and re-sterilize it, repeating the method just described. From the sterilizer run it into the bottles which are to be the final containers. They should have been recently sterilized, and the openings plugged with cotton while waiting to be filled. Crown caps are the best corks, as they can be readily sterilized. They can now be obtained lined with tin foil, so that the cork does not come in contact with the juice. Paraffin coated crowns should not be used, as the paraffin melts when the juice is bottled hot, giving the juice the appearance of settling out a second time.

In storing the bottles, lay them on the sides or with tops down; otherwise the crowns may dry out and leak after long storage. The use of amber glass bottles is recommended, but is not an absolute necessity.

When carbonating is to be carried out, run the juice from sterilizer through a cooling coil directly to the carbonator. The addition of a little carbon dioxid improves any sterilized juice. The amount to be used varies with the use to which the juice is to be put. For a breakfast beverage, the amount should be limited to a mere trace, just enough to freshen the flavor and remove the slightly flat taste of juice which has been heated. For ordinary purposes enough gas should be used to give a slight effervescence. If over-carbonated, gas masks the delicate flavor of the juice.

Care of Apparatus

Use extreme care in keeping all apparatus scrupulously clean. Each piece should be cleaned immediately after use, and then treated with boiling water just before it is used again. The bottling room should be small and so devised that it can be readily sterilized. Spilled juice should be cleaned off every day, and if possible, the whole room cleaned with hot water.

Grapefruit juice and blends of grapefruit with loganberry juice treated by this method have been kept for months

Citrus Blast and Its Control Explained

CITRUS BLAST AND ITS CONTROL EXPLAINED

Prof. H. S. Fawcett, of the California citrus experiment station, addressed the directors of the Exchange briefly on May 5th on the subject of "Citrus Blast," the disease which is causing some concern in certain northern counties of California. The purpose of his talk was to familiarize the directors and representatives of the several districts with the appearance of the twigs and leaves affected with the trouble so that they might instantly recognize it should it appear south of the Tehachepi.

Up to this time no indications of the disease have been found south of Fresno county, and the state agricultural officials as well as county officials are taking every precaution to see that it is not brought into the south. As it is not transmitted on fruit the effort is being concentrated on possible shipments of nursery stock which are being inspected under direction of Supt. Harry S. Smith of the pest control bureau of the state department of agriculture.

Professor Fawcett exhibited to the directors and others, sterilized specimens of twigs and leaves, mounted under glass, and these were passed about the room. The twigs and leaves had the appearance of having been subjected to extreme heat.

In introducing the subject, Prof. Fawcett said that citrus blast had been found chiefly in Butte and other northern counties; that it was first observed in 1912. In 1913 and 1914 the attack was mild, but in 1915-1916 it became serious again. In 1917-1918 it was mild, but in 1919 it attracted considerable attention. A survey which was made last year brought out evidences of it quite generally where citrus is grown north of Sacramento, Prof. Fawcett stated.

It was explained by Prof. Fawcett that citrus blast is active only in January and February, and sometimes in March. The rest of the year it is inactive. Its effect on lemons is quite mild and attacks the small branches and leaves only. When its activity ceases a reddish brown scab is formed. If very active, Prof. Fawcett stated, it would girdle the small twig and kill it.

Several blocks were sprayed with Bordeaux, Prof. Fawcett stated, and these did not show any of the disease later. The disease is most active in cool, damp weather and when the rainfall is highest. Records showed that the railfall was quite high during the seasons of the greatest activity of the disease and was very low when the disease showed least.

As the rainfall in the northern counties is much greater than in the south, Prof. Fawcett stated that he did not think that the danger was very great for a serious infection in Southern California, but stated that it might very easily be introduced into the south if proper care were not observed.

In conclusion Prof. Fawcett said that most years climatic conditions in the south were not such as to encourage the spread of the disease, but he warned that a careful watch should be kept for it.

Horticultural Commissioner H. J. Ryan of Los Angeles county, read extracts from a letter from H. S. Smith, in charge of the bureau of pest control of the state department of agriculture, in which Mr. Smith stated that a most painstaking effort was being made to prevent the further spread of the disease; that careful inspections were being made of all nurseries north of the Tehachepi mountains and that in only one nursery had he found evidences of the blast. There the nursery stock was dug up and burned. That nursery was in the Oroville district.

In a letter to Commissioner Ryan, Prof. Fawcett said that citrus blast was causing more damage to citrus trees in the northern counties than any other citrus disease he had known in California; that it might easily be introduced into the southern counties and it might be rather serious during certain winter and spring months, when the rainfall was exceptionally heavy, but that in average years he did not think the disease would become at all serious.

VALUABLE CITRUS PROPERTIES CHANGE HANDS

J. E. Cassels, G. W. Cassels and C. L. Porter have purchased valuable citrus grove properties at Brandon and Buckhorn Springs. The Barlow Land Company sold these gentlemen a twelve-acre pineapple orange grove, consisting of 1,250 trees, located at Brandon, and a 60-acre farm with 24 acres in grove. A portion of this is old seedlings trees, and the balance in two to five-year-old budded pineapple stock. The place is located at Buckhorn Springs, and is regarded as one of the finest in Hillsborough county.

Tillson Estate Is Recent Big Sale

Among the recent sales the leading transfer was that of the Tillson estate east of Leesburg. This was sold by L. M. Johnson, who has for years been the resident manager for the owner, Mr. White, of Rockland, Maine. The purchaser is H. E. Pritchett of Lakeland, associated with some Virginia capitalists under the name of the Brevard Naval Stores Company.

CANNOT AFFORD TO BE WITHOUT IT

Mr. S. L. Frisbie,
Editor Citrus Industry:

I am just in receipt of the May issue of your valued publication, the "Citrus Industry."

I want to say that in my judgment it is not only deserving the hearty support of every one interested in the citrus growing industry but it gives every promise of being a magazine no grove owner can afford to be without.

Sincerely yours,
K. H. Gerlach.

Lemon Scab is showing plentifully on fruit in many sections of Florida according to reports coming to this office from various citrus sections.

WITH THE CALIFORNIA CITRUS GROWERS

Control measures for brown rot are important as soon as fumigation is over in the fall, Commissioner Ryan states.

R. L. Knox, manager of the San Antonio Fruit Exchange, was recently called east by the death of his small son, who died while with his mother on a visit.

The Puente Mercantile Company of Puente has equipped a citrus packing house with a capacity for handling three cars of fruit a day.

With very gratifying results 17 women were employed on the 672-acre Hewes ranch at El Modena, Orange county, to pick lemons when their services could not be used in the packing house on account of the freight embargo.

J. Q. Mills, formerly cashier of the Ontario National Bank and secretary of the Chaffey Union High school, has become treasurer of the California Growers Association, incorporated. This is an organization of deciduous fruit growers which conducts five co-operative canneries.

The Butte County Citrus association of Oroville has elected these officers: G. E. Middlehoff, president; R. S. Powers, vice-president; J. A. Lawrence, F. H. Gray, E. E. Vaughan and E. H. McNamee, directors. Oscar Warner was re-elected secretary.

In the burning of the farmhouse owned by the Shoemaker Orchard Co. at Lindsay, a somewhat famous Tulare county landmark has been destroyed. The house, which has been occupied by S. E. Viau, the foreman of the ranch, was built in 1895, when the surrounding district was a grain field.

The McManus Citrus Products Company has been formed at National City and will have its plant in operation within thirty days. The company will prepare lemon and orange juice, for fountain uses, obtaining the juices from the W. J. Bush Citrus Products, which is directly across the street from the new factory.

R. P. Shields of the Summermount ranch, El Cajon valley, has had on exhibition at the San Diego Chamber of Commerce rooms a grapefruit which weighs 34 ounces and measures 18 inches in circumference. The fruit was declared by those who saw it as of fine color and having an unexpectedly good surface.

An infestation of citrus whitefly on the Stockdale ranch near Bakersfield is believed to have been brought under control through the joint efforts of state and county officials. The sum of $750 was expended under direction of H. S. Smith, entomologist of the state department of pest control. Superintendent Smith states that he hopes this will mark the end of infestation which has existed from time to time for several years, but that careful and frequent inspections will be made.

The Earl Fruit Company is now operating its Klamath box shook factory, which it purchased some time ago for $700,000.

A. M. Pratt, sales manager for the Mutual Orange Distributors, upon his return from his eastern trip, reported that the prospects of a good market for citrus fruits the coming season were excellent.

County Horticultural Commissioner Ryan of Los Angeles county reports that in certain districts the black scale is making rapid growth, but that no citrus aphis infestation of importance has been found this spring.

A new 24-acre tract east of Lincoln avenue, La Verne, has been set out to Valencias and navels by the new owners, C. E. Dresher, Ray Steves, Hanawalt Bros. and C. J. Brandt. A pipe line has been put in for irrigation.

The shipments by the Imperial Valley Grapefruit association this season amounted to 5460 boxes or 12 carloads. In addition 800 sacks of cull fruit was sold. Next year's crop is estimated at from 30 to 40 cars by Secretary S. F. Dolan of the association.

Prof. G. P. Gray, chemist, who has been located at Berkeley, expects to remove to Sacramento about July 1, to take up his work with the state department of agriculture. The new act places the enforcement of fungicide and insecticide work under the control of the state director of agriculture.

Prof. H. J. Quayle, entomologist of the citrus experiment station staff, is doing some special work on walnut pests and orange tortrix investigations. His headquarters are at Santa Ana, but his work takes him about Orange county generally. He will remain in that district most of the summer.

Joseph E. Rich, the newly chosen president of the Eleventh National Orange Show, has appointed his executive staff for next year and already plans are under way for the next exhibition. The advisory committee is made up as follows: John Anderson, Jr., A. G. Kendall, M. C. McKenney, S. W. McNabb, L. A. Murray, W. M. Parker, Ralph E. Swing and J. H. Wilson, all of San Bernardino.

HOW TO POISON ANTS

Ants often become troublesome in the house and about the grove, and in such cases when they cannot be reached, an effective method of control is to poison them, says J. R. Watson, Experiment Station Entomologist.

They destroy foodstuffs in the house, and protect mealy bugs and scale insects from their enemies, in the grove. Nursery stock suffers by ants eating out the young buds after they have been inserted.

Poisoned syrups are effective, and may be made by the following formulas:

16 pounds sugar dissolved in 2 gallons of water, 1 ounce sodium arsenate or 1 ounce white arsenic, 2 ounces sal soda, 1 ounce sodium hydroxide boiled until clear in 8 ounces of water, adding 16 pounds of sugar and sufficient water to make 3 gallons of syrup.

The best way to put out the poisons is by the use of cans with holes punched in the sides, large enough to allow the ants to get at the poison, but too small for bees and other larger insects to get in. These cans when covered prevent evaporation and dilution of the poison. The ants are able to get at the contents, and become so weakened that they cannot carry food back to the nests, which results in the death of the entire colony.

Carltons Purchase Jake Wey Grove

Clarence J. and Carey C. Carlton have become the owners of the old Jake Wey or Peters grove of fifty acres. This is a fine grove and is situated one and a half miles west of Brownville across the Peace river.

In addition to the grove there are 340 acres of other land. The consideration was $50,000.

BREAKING IN THE TRACTOR

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tion, less work will be delivered at the belt or drawbar. By over-loading the tractor its efficiency is reduced and its life considerably shortened. When testing for any kind of trouble it is best to make one adjustment at a time.

In summing up we find that the new tractor needs to be broken into work gradually. Give it plenty of oil, clean water and clean fuel. Do not be afraid to put money into overhauling. It pays in the long run. When the tractor is sick give it your home remedy—if that does not help call in the tractor doctor. A sick tractor is no good in the field.

PLANTING CITRUS TREES IN SUMMER

Each year the question of setting citrus trees during the summer season comes up. Many people do set trees during the rainy season of the summer, and when trees are carefully and quickly moved from nursery to grove, good results are obtained.

The following precautions suggested by E. H. Hurlebaus may save many trees especially if the setting is followed by a dry period:

Citrus trees do not have as pronounced a dormant period as deciduous trees but nevertheless the winter and early spring months are the best times to set out young trees. If the trees have been ordered, or for some reason must be transplanted during the summer months, the following points should be kept in mind:

First, don't let the trees dry out before setting them in the grove. If they are being moved from the nursery nearby, the problem of retaining moisture will not be so serious, but if they are being shipped from a distance get them to the grove and put them out as soon as possible after arrival at the station. If they should seem to be so dry that there is doubt of their living, putting the whole trees under water for twenty-four hours will often help. This should be done only when they seem very dry.

Second, don't expose the young trees to the sun any more than necessary before setting them. The roots dry out very quickly after being removed from the ground. Throw damp sacks over the whole trees or keep them in a shady place and take out only the tree that is to be set at once.

Third, after the tree is in the ground and the soil thoroughly firmed about the roots, make a shallow basin about the tree and water it well. Then pull dry earth over the wet spot around the tree, for if this is not done, the water evaporates in a very short time.

It is worth while to mention that watering young trees in dry weather is a very good investment. One or two waterings may save a young tree worth many times the cost of watering, to say nothing of the cost of a new tree, and the time and cost of replanting.

HOW TO CLEAN A TRACTOR QUICKLY

Keeping the tractor free from accumulation of a mixture of dirt and grease is important for these reasons: (1) It reduces the fire hazard; that is, a tractor is not so apt to catch fire, and if it does catch fire there is not the danger that it will be ruined, if the exterior of the machine is kept free from grease and dirt. (2) If the machine is not kept clean, the dirt which collects on it may work into the bearings or between other friction surfaces and cause unnecessary wear. (3) It not infrequently happens that a broken or loose part of the machine is hidden by a coating of grease and dirt, eventually resulting in damage if not discovered. Frequent, systematic cleaning would do away with possible damage from this source. (4) The moral effect of a clean tractor on the man or boy who operates it is also a factor of no small importance.

Probably the chief reason more tractor users do not take greater pains to keep their machines clean is because of the unpleasantness of the task. The usual method of scraping and wiping the greasy coating from a tractor not only takes a lot of time, but it is a mighty disagreeable job at the best. Not long ago, however, a tractor man I know told about a method he uses—the "shower bath" method.

Into one end of an 8-gallon galvanized iron tank, built to stand a pressure of 100 pounds per square inch, he fitted a valve and hose connection. He fills the tank about two-thirds full with kerosene, and then by means of a tire pump he forces air into the tank until a pressure of about 50 pounds per square inch is reached. The valve is then closed, the pump connection removed, and a length of spray hose 6 feet or more long and fitted with a spray nozzle is attached to the tank. The kerosene with a 50-pound pressure behind it cleans off the dirt and grease accumulations easily and quickly. In fact, this method is so effective that the entire tractor can be cleaned in a short time with a comparatively small amount of kerosene.—R. O.

COL. WILLINGHAM SELLS ALL OF HIS GROVE PROPERTY

Baron von Ufford of Holland, has bought the property of Col. Willingham near Owens. There are 283 acres in this tract, 200 acres of which are in grove. There is a ten-room residence with modern conveniences and five tenant houses, a large office, also the farming implements, tools and machinery went in the deal.

The consideration was $135,000. Col. Willingham bought 180 acres of this place with a 110-acre grove seven years ago for $90,000.

Baron von Ufford is not a stranger in Florida, having come to this state in his early youth, returning to Holland in 1909. At the outbreak of the war he returned to the States to his estate in Lynchburg, Va., later he purchased a fine estate on the west coast of Florida. Since January he has been in Lakeland, where he has a fine home. It is said that he will now establish his residence on his new purchase and make an estate of it. This is one of the best grove properties in the state and convenient to the station and packing house.

Last month Col. Willingham sold some groves in Seminole, Orange and Lake counties to J. L. Daniels of Chattanooga, Tenn., for a consideration of $30,000. With the sale of his home place he disposes of his last citrus grove.

The scarcity of good nursery stock both in Florida and California seems destined to curb considerably plans for additional citrus grove plantings.